

REMARKS

This amendment is filed in response to the Office Action dated May 5, 2006 in which claims 5 and 17 were allowed and claims 6-14 and 18-35 were withdrawn from consideration based on a restriction requirement and “constructive election” of claims 5 and 17. Claims 5 and 17 are hereby amended to more clearly describe the invention as claimed. New claims 36-63 are hereby added. Reconsideration and allowance of the pending claims is requested.

Claims 5 and 17 have been amended to call for “one or more” sensor modules instead of “a plurality” of sensor modules. Applicants submit that claims 5 and 17 as amended patentably define over the prior art of record for the reasons stated in the Office Action of October 7, 2005 (hereafter “the first Action”). Reconsideration and allowance of claims 5 and 17 is requested.

New claim 36 is directed to a method for monitoring a production process using a hardware monitoring device in conjunction with a linear variable differential transformer. The method of claim 36 includes steps for calibrating the device. According to the discussion of claims 5 and 17 in the first Action, this combination of steps is not found in the prior art of record. Consideration and allowance of claim 36 is requested.

New claims 37-47 correspond to withdrawn claims 6-14, 34 and 35, and new claims 48-63 correspond to withdrawn claims 18-33. Applicants submit that the inventions recited in the new claims and in claims 5 and 17 are not distinct for purposes of restriction. All of the claims are directed to methods or apparatuses for acquiring sensor data during a production process, processing the sensor data, and presenting the sensor data in visual format. Since all of the claims include these steps, the claims overlap in scope. According to MPEP § 806.05(d), claims generally are not restrictable when they are directed to subcombinations that overlap in scope.

Thus, Applicants submit it would be proper under the rules and procedures of the USPTO for the examiner to search and examine the new claims and the previously pending claims together. Accordingly, action on the merits of all the pending claims is requested.

As noted above, new claims 37-47 correspond to withdrawn claims 6-14, 34 and 35. In the first Action, claims 6 and 8-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,248,248 to Adly in view of U.S. Patent No. 6,362,768 to Younis et al. and U.S. Patent

No. 5,470,218 to Hillman et al. For the reasons set forth below, Applicants respectfully submit that the cited references in combination fail to teach or suggest the inventions of claims 37-47.

Claim 37 is directed to an apparatus for monitoring a production process performed by a production machine. The apparatus of claim 37 includes one or more module slots for receiving various types of sensor modules, a processing device, an interface circuit, a display device and an input device. The processing device performs a method of monitoring the production process. The steps of this method include (a) identifying the type of sensor module installed in each of the module slots, (b) calibrating the sensor module installed in each of the module slots, (c) acquiring a stream of data from the sensor module installed in selected ones of the module slots, (d) processing the stream of data and (e) generating a visual presentation for the stream of data.

It was stated in the first Action that the Adly patent, by reference to an “Allen Bradley PLC controller,” inherently discloses a processing device that identifies the sensor module installed in each of the module slots. To support this, the first Action cites Figure 3 of U.S Patent No. 4,510,565 to Dummermuth. Applicants respectfully disagree to the extent that neither the Adly or Dummermuth patents inherently or explicitly disclose a processing device that identifies *the type* of sensor module installed in each of the module slots. In the Allen Bradley PLC controller referred to in the Adly patent, “module identification” is actually set manually by a user using “configuration plugs.” (See Allen Bradly manual, Figures 2.7 – 2.10, pages 2.9 – 2.11.) This manual identification is different for each different input type.

Based on the disclosure of the Dummermuth reference taken as a whole, it is apparent that it is not necessary for the processing device of the Dummermuth system to identify the type of I/O module installed. As shown in Figure 3, the modules (18) always receive encoder inputs on certain terminals and tachometer inputs on certain terminals. (See also Figure 13.) Because there is no uncertainty in the Dummermuth system as to the type of sensors connected to the modules, there is no need to identify the type of sensor module installed. Thus, Adly and Dummermuth do not disclose or suggest a processing device that identifies *the type of sensor module* installed in each of the module slots as required by claim 37.

It is stated in the first Action that the Adly reference does not disclose a calibration function, but that Figure 3 of the Younis reference does. Applicants disagree to the extent that Younis does not disclose a processing device for calibrating sensor modules installed in module slots. Younis merely describes using a calibration signal to test the system with a known or variable voltage. (See 5:17-19.) Younis does not describe how this calibration signal is applied or controlled. Younis does not describe or suggest applying or controlling the calibration signal using a processing device. Thus, Younis does not describe or suggest a processing device for calibrating a sensor module as required by claim 37.

The Hillman reference also does not disclose a processing device that (a) identifies or (b) calibrates a sensor module as required by claim 37.

Hence, the combination of the Adly, Younis and Hillman references does not provide the processing device required by claim 37. Therefore, claim 37 patentably defines over the cited combination of references. Consideration and allowance of claim 37 is requested.

Claims 38-47 depend on claim 37 and define additional important aspects of the invention. Therefore, Applicants submit that claims 38-47 patentably define over the combination of Adly, Younis and Hillman for at least the same reasons as set forth above for claim 37. Consideration and allowance of claims 38-47 is requested.

Applicants submit that new claims 48-63 also patentably define over the prior art of record. With regard to claims 48-56, Applicants submit that the prior art of record does not describe or suggest splitting sensor data from at least one sensor module into first and second signals, processing the first and second signals independently and generating a visual representation of the first and second signals substantially simultaneously on a display device. With regard to claims 57-60, Applicants submit that the prior art of record does not describe or suggest the claimed steps for calibrating a hardware monitoring apparatus used in conjunction with a position sensor. With regard to claims 61 and 62, Applicants submit that the prior art of record does not describe or suggest the claimed steps for acquiring and displaying sensor data. With regard to claim 63, Applicants submit that the prior art of record does not describe or suggest the claimed steps for determining a type of

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sensor module installed in a hardware monitoring device. Consideration and allowance of claims 48-63 is requested.


In light of the foregoing discussion of the claims of the invention and the cited references, Applicants respectfully submit that a full and complete response to the Office Action is provided herein, and that all of the pending claims are now in condition for full allowance. Action in accordance therewith is respectfully requested.

If the Examiner identifies further issues that may be resolved by telephone, the Examiner is invited to contact the undersigned at (865) 546-4305.

In the event this response is not timely filed, Applicants hereby petition for the appropriate extension of time and request that the fee for the extension along with any other fees that may be due with respect to this paper be charged to our Deposit Account No. 12-2355.

Respectfully submitted,

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